



RECEIVED

JUL 19 2001

Group 2100

(19) Japanese Patent Office (JP)

(12) Laid-open Patent Gazette (A)

(11) Patent Application Number: Hei6-261069

(43) Date of Publication: September 16, 1994

(51) Int. Cl.<sup>5</sup> Internal Classification FI Indication of Technology

H04L 12/54

12/58

H04M 3/42 J

H04L 11/20 101 B

Examination Request: Not requested

Number of Claims: 2

OL

(Total 14 pages)

---

(21) Application Number: Patent Application Hei5-48024

(22) Application Filing Date: March 9, 1993

(71) Patent Applicant: 000005223

Fujitsu Ltd.

1015 Kami-Kodanaka, Nakahara-ku, Kawasaki-shi,  
Kanagawa

(72) Inventor Mikio Aoyama

c/o Fujitsu Ltd.

1015 Kami-Kodanaka, Nakahara-ku, Kawasaki-shi,  
Kanagawa

(74) Agent Fumio<sup>1</sup> Furutani, Attorney, one other

---

(54) Title of the Invention: Electronic mail distribution<sup>2</sup> system

---

<sup>1</sup> Translator's note: This reading is a best guess. Often there is no obvious and unambiguous reading for Japanese names, especially given names.

## **(57) Abstract**

**Object:** An object of this invention, which concerns an electronic mail distribution system, is to enhance the utility and convenience of electronic mail systems.

**Configuration:** An electronic mail distribution system, in which servers which perform transmission and reception of electronic mail between networks are provided at opposing ends of each network, is characterized in that address transmission means, which transmits to the electronic mail transmission means the user name and telephone number, is provided in the originating electronic mail terminal device; telephone number extraction means, an address conversion table, and address indexing means to index<sup>3</sup> the address conversion table using telephone numbers from the telephone number extraction means, are provided; and, electronic mail is distributed to the receiving electronic mail terminal device determined by the indexed network name and host name, and by the above user name.

## **Claims**

**Claim 1:** An electronic mail distribution method, in an electronic mail distribution system in which servers (6,8) which perform transmission and reception of electronic mail between networks (2,4) are provided at opposing ends of each network (2,4), characterized in that

in the originating electronic mail terminal device (10) are provided address transmission means (16) which are connected to the networks, and which transmit to the electronic mail transmission means (14), as the electronic mail address of the electronic mail to be sent from the originating electronic mail terminal device (10), the user name and telephone number of the receiving electronic mail terminal device (12);

there are provided, in the servers up until a server affiliated with said receiving electronic mail terminal device (12) which receives the electronic mail, telephone number extraction means (6a, 8a) which extracts telephone numbers from electronic mail addresses; address conversion tables (6b, 8b) which register network names and host names corresponding to said telephone numbers; and address indexing means (6c, 8c) which index said address conversion tables (6b, 8b) using telephone numbers from said telephone number extraction means (6a, 8a) when the electronic mail address of electronic mail consists of a user name and the telephone number of the receiving electronic mail terminal device; and,

---

<sup>2</sup> Translator's note: "Distribution" is used for the Japanese *haishin*, and "distribute" for *haishin suru*, because these terms were used in the English abstract; but "delivery" and "deliver" respectively could have been used as well.

<sup>3</sup> Translator's note: The first meaning of the Japanese here, *sakuin suru*, means "to index"--that is, to create an index. However, in this patent the term appears to be used to mean "to perform an indexed search for" (as from a table or database). Since there is some overlap here with English usage, I have employed "to index" for *sakuin suru* throughout.

electronic mail is distributed by distribution means (8d) of the receiving server to the receiving electronic mail terminal device, determined by the indexed network name and host name and by said user name.

**Claim 2:** An electronic mail distribution method, in an electronic mail distribution system in which servers (6,8) which perform transmission and reception of electronic mail between networks (2,4) are provided at opposing ends of each network (2,4), and electronic mail addresses are used in electronic mail distribution, characterized in that

in the originating electronic mail terminal device (11) are provided address transmission means (15) which are connected to said networks (2,4), and which send to the electronic mail transmission means (14) the electronic mail transmitted from the originating electronic mail terminal device (11) with said electronic mail address, and with the telephone number of the receiving electronic mail terminal device (12) attached; and,

in receiving servers (9) are provided detection means (9a) to detect the fact that electronic mail cannot be distributed to said receiving-destination electronic mail address; an address conversion table (9b) to convert from telephone numbers to receiving-destination electronic mail addresses; and distribution control means (9c) to cause distribution means (9d) to distribute electronic mail for which said distribution to a receiving-destination electronic mail address, obtained by indexing said address conversion table (9b) with a telephone number, is not possible, when there is a telephone number in electronic mail detected by said detection means (9a).

## **Detailed Description of the Invention**

0001

### **Industrial Field of the Invention**

This invention concerns an electronic mail distribution system which employs telephone numbers in the distribution of electronic mail.

0002

There is an electronic mail distribution network (hereafter called the "internetwork"<sup>4</sup>) which is used as a network capable of distributing current electronic mail. This internetwork is configured separately from telephone exchange networks.

0003

### **Prior Art**

An electronic mail address is necessary in order to distribute electronic mail over the above internetwork. In the internetwork, such electronic mail addresses consist of a three-level hierarchical address system, including the network name, host name, and user

---

<sup>4</sup> Translator's note: This presumably means the Internet, but the Japanese used is not the standard Japanese term for the Internet.

name (cf. Fig. 4(a)). In distribution over telephone exchange networks, a three-level hierarchical address system [is employed], including the country code, office number, and subscriber number.

0004

#### **Problem to be Solved by the Invention**

Because the address system in the above-described internetwork and the address system of telephone exchange networks are particular to each network, even in cases when terminal devices in the internetwork and terminal devices in a telephone exchange network are used at essentially the same place, in the internetwork, only electronic mail addresses can be used to transmit electronic mail.

0005

There are advantages and disadvantages to the addresses used in both networks under such circumstances. For example, electronic mail addresses used in the internetwork have the feature of being addresses possessed by individuals (users), whereas telephone numbers, as the consequence of thorough preparation over a long history, have the feature of not changing in such a complex manner as a host machine.

0006

In the internetwork, when the host name of the receiver and the network name are changed, if the host name specified by the originator in the electronic mail and the network name specification are not changed, the electronic mail is not distributed. The measure currently adopted to deal with this is, upon each change in electronic mail address, to send electronic mail and notify the terminal devices in question of the change. In this method, however, it is not easy to notify an indefinite number of users of the above change, due to the large number [of users]. Further, the internetwork itself is expanding dynamically and changing, so that it would be extremely difficult to perform unified management of the mail addresses used therein.

0007

The telephone numbers used in telephone exchange networks do not change so much as the electronic mail addresses used in the internetwork; but often telephone numbers are used by a plurality of persons, and in some cases it is inappropriate to use telephone numbers to specify an individual for communication.

0008

The present invention was created in light of this technical problem, and has as an object to provide an electronic mail distribution method capable of enhancing the utility and convenience of electronic mail systems.

0009

#### **Means for Solving the Problems**

Fig. 1 shows a block diagram of the principle of the invention of Claim 1; Fig. 2 shows a block diagram of the principle of the invention of Claim 2.

0010

As shown in Fig. 1, the invention of Claim 1, in an electronic mail distribution system in which servers 6,8 which perform transmission and reception of electronic mail between networks 2,4 are provided at opposing ends of each network 2,4, is characterized in that, in the originating electronic mail terminal device 10 are provided address transmission means 16 which are connected to the networks, and which transmit to the electronic mail transmission means 14, as the electronic mail address of the electronic mail to be sent from the originating electronic mail terminal device 10, the user name and telephone number of the receiving electronic mail terminal device 12; there are provided, in the servers up until a server affiliated with said receiving electronic mail terminal device 12 which receives the electronic mail, telephone number extraction means 6a, 8a which extracts telephone numbers from electronic mail addresses; address conversion tables 6b, 8b which register network names and host names corresponding to said telephone numbers; and address indexing means 6c, 8c which index said address conversion tables 6b, 8b using telephone numbers from said telephone number extraction means 6a, 8a when the electronic mail address of electronic mail consists of a user name and the telephone number of the receiving electronic mail terminal device; and, electronic mail is distributed by distribution means 8d of the receiving server to the receiving electronic mail terminal device, determined by the indexed network name and host name and by said user name.

0011

As shown in Fig. 2, the invention of Claim 2, in an electronic mail distribution system in which servers 6,8 which perform transmission and reception of electronic mail between networks 2,4 are provided at opposing ends of each network 2,4, and electronic mail addresses are used in electronic mail distribution, is characterized in that, in the originating electronic mail terminal device 11 are provided address transmission means 15 which are connected to said networks 2,4, and which send to the electronic mail transmission means 14 the electronic mail transmitted from the originating electronic mail terminal device 11 with said electronic mail address, and with the telephone number of the receiving electronic mail terminal device 12 attached; and, in receiving servers 9 are provided detection means 9a to detect the fact that electronic mail cannot be distributed to said receiving-destination electronic mail address; an address conversion table 9b to convert from telephone numbers to receiving-destination electronic mail addresses; and distribution control means 9c to cause distribution means 9d to distribute electronic mail for which said distribution to a receiving-destination electronic mail address, obtained by indexing said address conversion table 9b with a telephone number, is not possible, when there is a telephone number in electronic mail detected by said detection means 9a.

0012

#### **Action**

In the invention of Claim 1, when an electronic mail terminal device connected to a certain network is to transmit electronic mail to an electronic mail terminal device in another network, the user name and telephone number of the receiving electronic mail

terminal device are attached, as the electronic mail address, to the electronic mail, and the electronic mail is sent.

0013

In a single network midway before the electronic mail is received, or in two networks, or in a server in the receiving network, the network name of the network to which the above-mentioned electronic mail is to be sent, and the host name, are obtained separately or together by the address indexing means 6c,8c from the address conversion tables 6a,8a or similar.

0014

The network name and host name obtained in this way are distributed to the receiving electronic mail terminal device affiliated with the network by the distribution means 8d of a server of the receiving network.

0015

As explained above, the user name and telephone number are used as the electronic mail address, so that the greater ease of remembrance of the telephone number compared with an electronic mail address can be effectively utilized in electronic mail transmission, and nondelivery of electronic mail due to mistakes in electronic mail addresses can be alleviated. Hence while suppressing increases in electronic mail traffic due to nondelivery, electronic mail systems can be made to perform normal operations to distribute electronic mail, thereby enhancing the utility of electronic mail systems. The ease of remembrance of telephone numbers improves the utility of electronic mail systems, and can enhance the convenience of use of electronic mail systems.

0016

In the invention of Claim 2, by employing telephone numbers together with conventional electronic mail addresses, in addition to the advantageous effects obtained from the invention of Claim 1, even if nondelivery occurs for an electronic mail address, the changed electronic mail address can be sought using the telephone number. Hence while augmenting the utility and convenience of the above electronic mail system, further reductions in the traffic of the electronic mail system can be effected, and the load on system functions associated with transmission and processing of this type of electronic mail can be alleviated.

0017

## **Embodiments**

Fig. 3 shows the configuration of a system to implement the inventions of Claim 1 and Claim 2. This network consists of the internetwork 30, and a telephone exchange network 32. In Fig. 3, 34, 36, ..., 42 are users of the internetwork 30, have user names A, B, ..., E, and are also users of the telephone exchange network 32. The users 34, 36, 38 are accommodated in the network 60 via the hosts (hereafter called electronic mail terminal devices) 44, 46, 48, respectively. The network 60 is assigned the network name N1, and the electronic mail terminal devices 44, 46, 48 are assigned the host names X, Y, Z, respectively. Hence the users 34, 36, 38 use electronic mail on the internetwork 30

with a network name N1 and host names X, Y, Z. The users 34, 36, 38 are each assumed to be within the same organization as the user 40, described below, and are assumed to have the representative telephone number, for example 044-754-4111, assigned in the telephone exchange network 32J of Japan comprised by the telephone exchange network 32.

0018

Each of these electronic memory<sup>5</sup> terminal devices has, in addition to the conventional configuration of a CPU, memory, and electronic memory creation program to create electronic mail from characters input from a keyboard, an address processing program, stored in memory, which, when the telephone numbers described above are input from the keyboard, processes these telephone numbers in place of conventional electronic mail addresses so as to become electronic mail addresses, as shown in Fig. 4(b).

0019

The user 40 is accommodated on the internetwork 30 in the network 62, via the electronic mail terminal device 50. The network 62 is assigned the network [name] N2, and the electronic mail terminal device 50 is assigned the host name V. Hence the user 40 uses electronic mail on the internetwork 30 under the network name N2 and host name V. This user 40 is also assumed to have the above-mentioned representative telephone number, shared with the users 34, 36, 38, which is a telephone number assigned on the telephone exchange network 32J of Japan, comprised by the telephone exchange network 32.

0020

The user 42 is accommodated on the internetwork 30 in the network 62, via the electronic mail terminal device 52. The network 62 is assigned the network [name] N3, and the electronic mail terminal device 52 is assigned the host name W. Hence the user 42 uses electronic mail on the internetwork 30 under the network name N3 and host name W. In contrast with the users 34, 36, 38, 40, the user 42 has a telephone number, for example 312-996-2111, which is assigned on the telephone exchange network 32U of the United States, comprised by the telephone exchange network 32.

0021

The networks N1, N2 are managed by the server SV1, and the network N3 is managed by the server SV2. The server SV1 is provided between the networks 60, 62, 66, at opposing ends of each network; similarly for the server SV2. Each server comprises a UNIX workstation, and each server has an address list of electronic mail terminal devices which are affiliated with and receive the services of each server accommodated in the network with which the server is affiliated, and also has a user list which registers users

---

<sup>5</sup> Translator's note: "mail" was probably intended here. Similarly, "electronic memory creation program" should probably be "electronic mail creation program" (similar characters are used for the Japanese terms for "mail" and "memory").

for each electronic mail terminal device. These lists are used by the main control system (MCS) (configured having programs) provided in each server, and are used in control of the transmission and reception of electronic mail. A server has a transmission unit and reception unit, not shown; electronic mail for transmission under control of the above mail control system is transmitted to the opposing server, and electronic mail from the opposing server is received by the above reception unit. If received electronic mail is addressed to the network, it is distributed to an electronic mail terminal device in the network under the control of the above mail control system; if it is not addressed to the network, it is similarly distributed to the next network.

0022

In Fig. 3, ESS denotes the telephone exchange equipment, and 70 denotes the telephone exchange network. Fig. 5 extracts from Fig. 3 and shows the configuration of the internetwork between the user 34 and the user 42. Mail control systems MCS1, MCS2, such as those shown in Fig. 6 and Fig. 7 respectively, are provided in the server SV1 and the server SV2 in this internetwork. In these mail control systems MCS1, MCS2 are respectively provided transmission/reception control programs MAS1, MAS2; network address control programs NAC1, NAC2; address conversion control programs ATC1, ATC2; and address databases ADB1, ADB2. Mail control systems similar to MCS1, MCS2 provided in the above-mentioned servers SV1 and SV2 are also provided in the other servers in the internetwork. In Fig. 5, the numbers 1, 2 in circles indicate continuance with the numbers 1,2 in circles in Fig. 7; and the numbers 3,4 in circles indicate continuance with the numbers 3,4 in circles in Fig. 6 and in Fig. 10.

0023

In Fig. 3 through Fig. 12, the network 60 and similar correspond to the network 4 in Fig. 1 and Fig. 2, and the network 64 and similar correspond to the network 4 in Fig. 1 and Fig. 2. The server SV1 or the server SV2 correspond to the server 6 in Fig. 1 and Fig. 2, and the server SV2 or the server SV1 correspond to the server 8 in Fig. 1 and Fig. 2. The electronic mail terminal device 44 or similar corresponds to the originating electronic mail terminal devices 10, 11 in Fig. 1 and Fig. 2. The electronic mail terminal device 50 or similar corresponds to the reception electronic mail terminal device 12 in Fig. 1 and Fig. 2. The CPU, memory, transmission/reception control program, and transmission unit of the electronic mail terminal device 44 or similar correspond to the electronic memory<sup>6</sup> transmission means 14 in Fig. 1 and Fig. 2, and the CPU, memory, address processing program and keyboard of the electronic mail terminal device 44 or similar correspond to the address transmission means 15 and address transmission means 16 in Fig. 1 and Fig. 2. The CPU, memory, and the program to perform the processing of step S3 in Fig. 8, of the server SV1 or the server SV2 correspond to the telephone number extraction means 6a,8a of Fig. 1; and the address database ADB1 of Fig. 6 and address database ADB2 of Fig. 7 correspond to the address conversion tables 6b,8b of Fig. 1. The CPU, memory, and program to perform the processing of steps S4 and S5 in Fig. 8, of the server SV1 or the server SV2 correspond to the address indexing means 6c,8c of Fig. 1, and the CPU,

---

<sup>6</sup> Translator's note: This too should probably be "mail".



memory, and program to perform the processing of step S6 in Fig. 8, of the server SV2 or the server SV1 correspond to the distribution means 8d of Fig. 1. The server SV1 or server SV2 corresponds to the receiving server 9 of Fig. 2, and the CPU, memory, and memory<sup>7</sup> transmission/reception control program of server SV1 or server SV2 corresponds to the detection means 9a of Fig. 2. The mail address list of Fig. 12 corresponds to the address conversion table 9b of Fig. 2, and the CPU, memory, and program to perform the processing of steps S1 through S5 in Fig. 11 of the server SV1 or the server SV2 correspond to the distribution control means 9c of Fig. 2. The CPU, memory, and program to perform the processing of step S6 in Fig. 11 of the server SV1 or the server SV2 correspond to the distribution means 9d of Fig. 2.

0024

Processing to distribute electronic mail in the invention of Claim 1, with the configuration already described, is explained below. As shown in Fig. 5, it is assumed that user E is the originating user, and that an electronic mail address such as shown in Fig. 4(b) is specified as the electronic mail address. The format of the telephone number shown in Fig. 4(b) is an internationally established telephone number. The "+" within the telephone number is the leading character of the country code of the telephone number, which is an international standard; this is used as a symbol distinguishing the user name [from the telephone number]. In this telephone number, the country number 81 denotes Japan, as also shown in Fig. 3.

0025

The mail<sup>8</sup> transmission/reception control program MAC2 of the server SV2 which has received the above-specified electronic mail address recognizes the country number within the above electronic mail address (cf. S1 in Fig. 8), and sends the electronic mail to the corresponding distribution server SV1. At this time, because this is electronic mail origination (cf. "Yes" at S2 in Fig. 8), the electronic mail address of the electronic mail is referenced. This electronic mail address is a telephone number (cf. "Yes" at S3 in Fig. 8), and so the network address control program NAC2 passes the telephone number to the address conversion program ATC2, and the address database ADB2 is indexed using the domestic telephone number, for example 44-754-4111 in Fig. 4(b), to obtain the receiving network address name and host address name. These electronic mail addresses are set in the electronic mail being transmitted, and the electronic mail is sent to the next relay network or to the receiving network.

0026

In processing to judge whether mail has been originated or received in the processing of the mail transmission/reception control program executed by servers of relay networks receiving electronic mail, or by receiving networks, the mail is found to be relayed or received (cf. "No" at S2 in Fig. 8), and so in determination of the type of electronic mail address of the electronic mail, because a telephone number format [is

---

<sup>7</sup> Translator's note: Again, "mail" was probably intended.

<sup>8</sup> Translator's note: A misspelling in the original is assumed here.

used] (cf. "Yes" at S10 in Fig. 8), after performing search processing for the receiving country network (cf. S11 in Fig. 8), the path in the receiving country network is determined (cf. S12 in Fig. 8). At a server in this relay network, all or part of processing to convert to the network name and host name may be performed, in place of the originating network server.

0027

As explained above, when telephone conversion processing is not performed completely, or even partially, by a server of the originating-side network, or by a server of a relay network, and a telephone number is included with the electronic mail as the electronic mail address and transmitted up until a receiving server in the receiving-side network, in the receiving server processing is performed to convert the above-mentioned telephone number into the network name and host name to obtain the conventional mail address format, and then the electronic mail is sent to the electronic mail terminal device specified by the network name and host name, and the electronic mail is received.

0028

By means of an electronic mail system capable of executing the above-described electronic mail distribution, telephone numbers, which are easier to remember than electronic mail addresses, can be effectively utilized in the transmission of electronic mail, and so nondelivery of electronic mail due to mistakes in electronic mail addresses can be alleviated. Hence while suppressing increases in electronic mail traffic due to nondelivery, electronic mail systems can be made to perform normal electronic mail distribution operations, thereby enhancing the utility of electronic mail systems. The ease of remembrance of telephone numbers can improve the utility of electronic mail systems, and can enhance the convenience of use of electronic mail systems.

0029

Next, Fig. 3, Fig. 5 and Fig. 9 through Fig. 12 are used to explain one embodiment of the invention of Claim 2. This invention provides means for remedy of cases of nondelivery of electronic mail (electronic mail is not distributed), during use of conventional electronic mail addresses.

0030

This remedy means is the configuration of an embodiment of the invention of Claim 1, explained in Fig. 3 through Fig. 8, with the following configuration added. First, all electronic mail terminal devices have, in addition to the conventional configuration--that is, a CPU, memory, and electronic memory<sup>9</sup> creation program to create electronic mail from characters input from a keyboard--an address processing program, stored in memory, which, when an aforementioned telephone number is input from the keyboard, performs processing such that the telephone number becomes the electronic mail address in place of the conventional electronic mail address, as shown in Fig. 9.

0031

---

<sup>9</sup> Translator's note: Again, probably should be "mail".

Second, as shown in Fig. 10, the overall electronic mail system is configured such that there are provided in each server, for example in server SV1, a mail nondelivery control program UDC1 (cf. Fig. 11) which, when it is judged in the mail transmission/reception control of the server's mail transmission/reception control program MAC1 that there is electronic mail nondelivery, receives notification to this effect, investigates mail address changes using the telephone number within the electronic mail, and when there is a change report, initiates control for distribution to the electronic mail address after the change, as well as a mail address list (cf. Fig. 12) which is referenced by the mail nondelivery control program UDC1. In the above mail address list are registered, for future use, the new and old host names, or new and old network names and new and old host names, corresponding to telephone numbers as shown in Fig. 12, to be used by the host when there is a change in the host name or in the network name and host name to which electronic mail received by each server is addressed. Other aspects of this configuration are similar to the configuration of the embodiment of the invention of Claim 1, explained in Fig. 3 through Fig. 8, and so explanations of these [aspects] are not repeated.

0032

Processing to distribute electronic mail in the invention of Claim 2, with the configuration described above, is explained below. If in distribution processing there is no nondelivery of electronic mail, then electronic mail distribution processing in this invention is the same as the electronic mail distribution explained in the embodiment of the invention of Claim 1, explained in Fig. 3 through Fig. 8.

0033

In this distribution, when nondelivery occurs in a receiving server, for example in server SV1, this nondelivery is detected by the mail transmission/reception control program MAC1. The mail nondelivery control program UDC1 is notified of this nondelivery.

0034

In the mail nondelivery control program UDC1, nondelivered electronic mail is collected (cf. S1 in Fig. 11), and the electronic mail is checked for the presence of a "care of" (c/o) entry (Cf. S2 of Fig. 11, Fig. 9). If there is no such entry (cf. "No" in S2 of Fig. 11), the originator is notified of nondelivery (cf. S7 in Fig. 11).

0035

If there is such an entry (cf. "Yes" in S2 of Fig. 11), the mail address list is indexed using the telephone number, and the old host name, or the old network name and the old host name, as well as the new host name, or the new network name and the new host name, are obtained (cf. S3 in Fig. 11). If the old host name, or the old network name and the old host name, coincide with the host name, or the network name and host name, of the newly arrived electronic mail (cf. "Yes" in S4 of Fig. 11), the new host name, or the new network name and new host name, are set in the electronic mail (cf. S5 in Fig. 11), and electronic mail transmission processing is performed (cf. S6 in Fig. 11). If the

above coincidence is not obtained (cf. "No" in S4 of Fig. 11), the originator is notified of nondelivery (cf. S7 in Fig. 11).

0036

By this means, reliable distribution functions in an electronic mail system can be enhanced, and the utility of the electronic mail system can be improved. This invention offers satisfactory electronic mail utility and can improve convenience. If there is nondelivery of electronic mail, this electronic mail causes an increase in the traffic of the electronic mail system; but the invention of Claim 2 is effective in reducing this [increase], and can alleviate the load on system functions pertaining to this kind of electronic mail transfer processing.

0037

### **Effect of the Invention**

By means of the invention explained above, as already described, telephone numbers, or else conventional electronic mail addresses together with telephone numbers, are used as electronic mail addresses, so that the greater ease of remembrance of telephone numbers compared with electronic mail addresses can be utilized effectively in electronic mail origination, and nondelivery of electronic mail due to mistakes in mail addresses can be alleviated. Hence while suppressing increases in electronic mail traffic due to nondelivery, electronic mail systems can be made to perform normal electronic mail distribution operations, thereby improving the utility of electronic mail systems. The ease of remembrance of telephone numbers improves the utility of electronic mail systems, and can enhance the convenience of use of electronic mail systems.

0038

By combining telephone numbers with conventional electronic mail addresses, even when nondelivery occurs for an electronic mail address, the telephone number can be used to seek changes in electronic mail addresses. Hence while obtaining improved utility and convenience of the above electronic mail system, further reductions can be made in the traffic of the electronic mail system, and the load on system functions associated with transmission and processing of this type of electronic mail can be alleviated.

### **Brief Description of the Drawings**

Fig. 1: Block diagram of the principle of the invention of Claim 1.

Fig. 2: Block diagram of the principle of the invention of Claim 2.

Fig. 3: Drawing showing the configuration of a system which implements the inventions of Claim 1 and Claim 2.

Fig. 4: Drawing showing the configurations of conventional electronic mail addresses and of electronic mail addresses using the invention of Claim 1.

Fig. 5: Drawing which extracts and shows the configuration of the internetwork between one user in the system of Fig. 3 and another user.

Fig. 6: Drawing showing a mail control system provided in a server providing services to one of the users in Fig. 5.

Fig. 7: Drawing showing a mail control system provided in a server providing services to the other of the users in Fig. 5.

Fig. 8: Drawing showing the flow of processing related to the inventions of Claim 1 and Claim 2 in the mail control systems provided in servers.

Fig. 9: Drawing showing the configuration of electronic mail addresses used in the invention of Claim 2.

Fig. 10: Drawing showing the mail control system corresponding to Fig. 6 in the invention of Claim 2.

Fig. 11: Drawing showing the flow of processing of characteristic parts of the invention of Claim 2.

Fig. 12: Drawing showing an example of a mail address list.

#### **Explanation of Symbols**

2	Network
4	Network
6	Server
8	Server
10	Originating electronic mail terminal device
11	Originating electronic mail terminal device
12	Receiving electronic mail terminal device
14	Electronic mail transmission means
15	Address transmission means
16	Address transmission means
6a	Telephone number extraction means
8a	Telephone number extraction means
6b	Address conversion table
8b	Address conversion table
6c	Address indexing means
8c	Address indexing means
8d	Distribution means
9a	Detection means
9b	Address conversion table
9c	Distribution control means

9d	Distribution means
44	Electronic mail terminal device
46	Electronic mail terminal device
48	Electronic mail terminal device
50	Electronic mail terminal device
52	Electronic mail terminal device
60	Network
62	Network
64	Network
66	Network
SV1	Server
SV2	Server

Fig. 1

Block diagram of the principle of the invention of Claim 1

14 Electronic mail transmission means

16 Address transmission means

6a Telephone number extraction means

6c Address indexing means

6b Address conversion table

Distribution means

Server

Server

8d Distribution means

8a Telephone number extraction means

8c Address indexing means

Address conversion table

12 Receiving electronic mail terminal device

Fig. 4

Drawing showing the configurations of conventional electronic mail addresses and of electronic mail addresses using the invention of Claim 1

(a) Conventional address configuration

User name

Host name

Network name

(b) Address configuration of this invention

User name

Telephone number

Fig. 9

Drawing showing the configuration of electronic mail addresses used in the invention of Claim 2

To: Destination electronic mail address

Co:

Subject: Subject  
Cc: Destination electronic mail address for copy

Fig. 2

Block diagram of the principle of the invention of Claim 2

- 14 Electronic mail transmission means
- 15 Address transmission means
- 6 Server
- 9d Distribution means
- 9 Receiving server
- 9a Detection means
- 9c Distribution control means
- 9d<sup>10</sup> Address conversion table
- 12 Receiving electronic mail terminal device

Fig. 5

Drawing which extracts and shows the configuration of the internetwork between one user in the system of Fig. 3 and another user

User name = A

Host name = X

Host = W

User = B

Fig. 12

Drawing showing an example of a mail address list

Telephone numbers

Old electronic mail addresses

New electronic mail addresses

Fig. 3

---

<sup>10</sup> Translator's note: This should probably be "9b".



Drawing showing the configuration of a system which implements the inventions of Claim 1 and Claim 2

Range of users with network name N1

Host name = Y

User name = B

Network name = N1

Host name = X

User name = A

Host name = Z

User name = C

Network name = N2

Host name = V

User name = C

Network name = N3

Host name = W

User name = E

Internetwork: 30

Telephone exchange network: 32

User with Japan telephone number 044-754-4111

User with U.S. telephone number 312-996-2111

Fig. 6

Drawing showing a mail control system provided in a server providing services to one of the users in Fig. 5

MAC1          Mail transmission/reception control

NAC1          Network address control

ATC1          Address conversion control

ADB1          Domestic telephone numbers

Domestic telephone numbers

Network addresses

Host addresses

Host addresses

Fig. 7

Drawing showing a mail control system provided in a server providing services to the other of the users in Fig. 5

MAC2          Mail transmission/reception control

NAC2          Network address control

ATC2          Address conversion control

ADB2          Domestic telephone numbers

Domestic telephone numbers

Network addresses

Host addresses

Fig. 8

Drawing showing the flow of processing related to the inventions of Claim 1 and Claim 2 in the mail control systems provided in servers

Mail transmission/reception control

S1      Mail transmission/reception analysis

S2      Mail = origination?

S3      Address format = telephone number?

S4      Network, host name search

S5      Receiving network, host name search

S6      Mail transmission processing

S10     Address format = telephone number?

S11     Receiving country network search

S12     Determine receiving country network path

Fig. 10

Drawing showing the mail control system corresponding to Fig. 6 in the invention of Claim 2

MAC1          Mail transmission/reception control

UDC1          Mail nondelivery control

NAC1          Network address control

ATC1          Address conversion control

ADB1          Domestic telephone numbers

Domestic telephone numbers

Network addresses

Host addresses

Host addresses

Fig. 11

Drawing showing the flow of processing of characteristic parts of the invention of Claim  
2

Mail nondelivery control

S1     Nondelivered mail collection

S2     C/o entry present?

S3     Network, host name search

S4     Different from current address?

S5     Set receiving network, host name

S6     Mail transmission processing

S7     Notify originator of nondelivery